

## INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) APPLICATION FOR SERVICE DELIVERY IN SELECTED FEDERAL UNIVERSITY LIBRARIES, NORTH-EAST ZONE, NIGERIA

By

**Gajimi Abba Ibrahim**

Ramat Library,  
P.M.B 1069,  
University of Maiduguri, Maiduguri, Borno State, Nigeria  
[abgajimi@gmail.com](mailto:abgajimi@gmail.com)  
07036385933

**Prof (Mrs) Fatima L. Ibrahim**

Department of Library and Information Science,  
P.M.B 1069,  
University of Maiduguri, Maiduguri, Borno State, Nigeria.  
[fatimahibrahim500@gmail.com](mailto:fatimahibrahim500@gmail.com)

**Dr. (Mrs) Talatu Rabasa**

Department of Library and Information Science,  
P.M.B 1069,  
University of Maiduguri, Maiduguri, Borno State, Nigeria.  
[talaturabasa@gmail.com](mailto:talaturabasa@gmail.com)

### Abstract

The study examines how Information and Communication Technology (ICT) is applied in service delivery within federal university libraries in Nigeria's North-East Zone. Despite ICT's transformative impact on libraries globally, these institutions face significant challenges such as outdated infrastructure, unreliable electricity, and poor internet connectivity. The study aimed to assess the types and extent of ICT use, its impact on services, and the challenges faced. Using a survey method involving 105 librarians, it found that while some services (like digital libraries and internet services) are ICT-driven, most remain non-digital. Common ICT tools include computers, printers, OPAC, and email. ICT has improved efficiency and user satisfaction, but also brings issues like health concerns and system dependency. Major challenges include inadequate funding, unstable power supply, and insufficient facilities and training. The study recommends full adoption of electronic services, acquisition of modern ICT tools, and improved library funding and staff training to enhance service delivery.

**Keywords:** ICT Application, Service delivery, University libraries.

### Introduction

Information and Communication Technology (ICT) is a term used to describe the various technologies that are used in the processing of information, including coding, creation, storage, retrieval, manipulation, dissemination, and transmission (Zulu, 2011). UNESCO (2010) stated that the term "ICT" is plural and refers to a variety of technologies. It is an all-encompassing term that covers the entire range of electronic

tools that collect, record, and store information and with which we exchange and pass information on to others. ICTs consist of many different tools that enable quick and easy capture, interpretation, storage, and transmission of information. Ngenge (2016) also defined ICT as all technologies that enable the handling and storage of information and facilitate communication between people and electronic systems, as well as between electronic systems themselves. This view encompasses the entire

spectrum of ICT and includes capture technologies that collect information and convert it into digital forms, such as keyboards, mice, voice recognition systems, barcode readers, and image scanners, to name a few. Following closely behind are storage technologies such as hard drives, optical media (e.g. CD-ROMs), micro cards, and smart cards (e.g. those used in financial transactions).

The application of ICT for library service delivery has undergone various levels of development. An automated cataloguing, circulation, and acquisition system has led to better management of library operations and improved service delivery. Today, ICT is providing libraries with powerful new tools to meet their patrons' information needs beyond their traditional printed materials, such as adopting social media. With internet connectivity, university libraries can reach beyond their walls to provide patrons with resources available in their libraries. Social media as typified in the library 2.0 model, are increasingly becoming part of libraries and they are tools for enhancing library services and resources (Tiemo & Edewor, 2011). Many libraries are effectively using Twitter to communicate services like opening times, new arrivals, etc., while others have developed applications that enable users to search catalogues from within Facebook (Baro & Asaba, 2010). There is no doubt that the application of ICTs has provided one of the best innovations in the history of libraries, and it is changing the shape of libraries and the role of librarians to an unprecedented extent (Lewis, 2007).

### **Statement of the problem**

The advent of Information and Communication Technology (ICT) has transformed libraries from mere repositories of knowledge to vibrant hubs of information services. However, the university libraries in the North-East Zone of Nigeria seem to be grappling with inadequate ICT infrastructure, characterised by unreliable power supply, limited internet connectivity, and outdated hardware and software systems. This deficiency hinders the seamless integration of ICT into service delivery, compromising the overall efficiency and effectiveness of operations.

Observation has shown that inadequate electricity, internet, and computer facilities pose a serious setback to effective service delivery in university libraries. As Jansen (2017) opined, the introduction of ICT disrupts established procedures and workflows, prompting resistance from some library staff. Overcoming this resistance requires a great change in management methods, clear communication, and sufficient training to facilitate a smooth transition to new ICT-based processes. However, most university library staff possess traditional library service delivery skills and struggle to cope with the current technological trends, fearing job loss. Library services require technologically oriented librarians to manage the entirety of library services effectively.

Furthermore, observations by the researcher have also shown that university libraries seem to face the challenge of insufficient funds, which are essential for sustaining and updating ICT facilities. Therefore, the future of libraries in the digital age of ICT depends heavily on the resources available to them. Against this backdrop, this study investigates the Information and Communication Technology (ICT) applications for service delivery in selected Federal University Libraries, North-East Zone, Nigeria.

### **1.3 Objectives of the study**

The objectives of the study were to determine;

- i. Types of Library Service Delivery in Federal University Libraries, North-East Zone, Nigeria.
- ii. Types of ICT facilities available in Federal University Libraries, North-East Zone, Nigeria.
- iii. Impact of ICT Application on Service Delivery in Federal University Libraries, North-East Zone, Nigeria.
- iv. extent of utilisation of ICTs for service delivery in Federal University Libraries, North-East Zone, Nigeria.
- v. challenges facing the application of ICT in service delivery in Federal University Libraries, North-East Zone, Nigeria.

## 1.4 Research Questions:

The study was guided by the following research questions:

- i. What are the types of library service delivery in Federal University Libraries, North-East Zone, Nigeria?
- ii. What are the types of ICT facilities in Federal University Libraries, North-East Zone, Nigeria?
- iii. What are the impacts of ICT applications for service delivery in Federal University Libraries, North-East Zone, Nigeria?
- iv. What is the extent of utilisation of ICTs for service delivery in Federal University Libraries, North-East Zone, Nigeria?
- v. What are the challenges facing the application of ICT in service delivery in Federal University Libraries, North-East Zone, Nigeria?

## LITERATURE REVIEW

IFLA (2001) identified some of the services rendered by libraries to users with special needs as special support, such as mobile libraries, books, and other forms of transport to serve those living in isolated areas, services for those confirmed by institutions such as prisoners and those hospitalized, special material for people with learning difficulties such as easy-to-read materials and cassettes, electronics communication such as internet as well as special equipment and reading materials for those with physical and sensory disabilities such as the hearing and visual impairment.

Generally, the term ICT is commonly used to mean a combination of computer and communication technologies used for information storage and dissemination. Khan (2016), in his terms, posited that ICT deals with the use of electronic computers and software to convert, store, process, transmit and retrieve information. It is a generic term that covers the acquisition, processing, storage, and dissemination of information. It involves the application of computers and communication technology in the task of information handling and information flow from generation to utilization levels.

Krubu and Osawaru's (2019) findings identified ICT resources and the use of the

resources available at John Harris and Benson Idahosa University libraries as search engines, the internet, CD-ROM, Online databases, and the World Wide Web. These resources are used to acquire, store, process, retrieve, and disseminate information. ICT has made it possible for Nigerian academic libraries to use the internet for search engines such as Yahoo, Google, e-mail, etc, and to access online digital resources such as Amazon, Wikipedia, etc Similarly Abubakar (2020) in a study on availability and use of ICT in six Nigerian university library schools; notably identified availability of computers, internet, CD-ROMS, e-mail, microfilm, microfiche, videotapes, and slide projectors as resources available and that they use the resources notably for education and training.

Anup S (2019) investigated ICT and its impact on library and information services: A case study of Kendriya Vidyalaya Libraries of Kendriya Vidyalaya Sangthan all over India. The present study demonstrates and elaborates on the primary way to learn about ICTs, the purpose of using ICT-enabled library services, to assess to what extent users utilise ICT-based library services and facilities, various aspects of Internet usage, favourite search engines, and problems faced by the users in using ICT in libraries. The papers also determine the satisfaction level of users regarding library services, online database services, and infrastructure facilities. Suggestions have been given to make the service more beneficial to the library users of Kendriya Vidyalaya.

Libraries of Kendriya Vidyalaya Sangthan all over India.

Krubu and Osawaru (2021) reveal some factors hindering the impact of ICT in Nigerian university libraries as lack of search skills, epileptic power supply, expensive software and hardware, and huge amount of money spent to fuel generators. In a similar vein Ikupolati, (2019) revealed the challenge associated in university libraries with the ICT technical infrastructure in most libraries is the lack of adequate ICT facilities. Lack of funding means that most libraries are not able to acquire adequate ICT facilities to enable them to provide efficient and effective ICT-based information resources and

library services to their users. Most libraries cannot get adequate bandwidth to enable them to provide fast access to online-based information services. In some libraries, the internet connection is so slow that sometimes it is impossible to download and print documents from the internet.

Information technology has changed the system of acquisition, technical processing, and circulation activities in libraries in a way that library patrons can get entry to their information. It is obvious that without computers and the internet, it will be difficult for libraries to provide their clients with sufficient information in this age of information technology. Information communication and technology have changed the entire planet into a global village. This has hastened electronic librarianship with different library amenities and services to its clientele. The idea of electronic libraries OPAC, Hypertext, and teleconferences for the use of library and information services has become universal. Innovative scientific developments have deeply affected libraries, and practically every task performed in a library has been taken over by electronic mechanisation and telecommunication. Anup (2019) opines that the application of ICT in university libraries for service delivery reduces the tedious and energy-sapping tasks associated with manual operations in the library. It enables university library staff to reduce repetition, sharing of information resources among libraries, drudgery, and time-consuming activities such as typing, record-keeping, and accounting. Madu (2004) revealed that the application of ICT in library operations is that the library staff will have more energy and time, which can be used to attend to more library users and perform more professional duties.

A study carried out by Aliyu, Hassan, and Mohammed (2021) on the application of ICT for resource organisation and service delivery in academic libraries in the state of Nigeria. The specific objectives and research questions cover the ICT facilities for resource organization, the areas in which ICT is applied for resource organization, the extent of use of ICT in the organization of library resources, the

challenges associated with the utilization of ICT facilities in academic libraries in Bauchi state, and strategies for enhancing the effective use of ICT facilities for effective resources organization and service delivery in academic libraries in Bauchi State, Nigeria. The population of the study consists of one hundred and fifteen (115) professional and Para-professional library staff in the academic libraries under study, as follows: Abubakar Tafawa Balewa University, 32; Bauchi; Bauchi State University, Gadau, 22; Abubakar Tatari Ali Polytechnic, Bauchi, 13; Federal Polytechnic Bauchi, 24; Bauchi State College of Agriculture, 5; A.D Rufa'i College of Legal and Islamic studies, Misau, Bauchi state 7; College of education Kangere, 5, and Aminu Saleh College of education, Azare, Bauchi state, 7. The researcher used the population since it is manageable. As such, it does not require a sample and sampling technique. The instruments used for data collection for the study are a questionnaire and an observation checklist. Percentages and means were used for data analysis. The major findings of the study revealed that out of 21 ICT resources relevant to resource organisation, only 16 were available for use; five resources are not available in the academic libraries in Bauchi state. The available ones include networked computers, standalone computers, printers, scanners, Internet facilities, e-mail, CD-ROM Technology, DVD-ROM, Online Public Access Catalogue (OPAC), projectors, library-based software, flash drives, Local Area Network (LAN), Wireless Internet Access, and Telefacsimile equipment. The study recommended, among others, making it mandatory for library personnel to be ICT oriented, increasing funding, as well as training and re-training of professional and para-professional staff. Good networking and maintenance culture should also be exhibited for effective utilisation of ICT for resource organisation and service delivery in academic libraries.

Conversely, Muhammad and Elvis (2021) investigated academic libraries and the challenges of service delivery in Nigerian universities in the Digital Era. It highlights the development of libraries in the digital era as a magical solution to meet the information needs of library users in the

digital society, showing great sensitivity to the use of new technologies. It also explores new trends in providing information that librarians can use to re-establish the academic library to provide effective services. Lack of efficiency, technological inefficiency, and inadequate energy supplies were highlighted as some of the challenges of providing information services in a digital society. Librarians should strive to acquire ICT skills through personal training to be relevant and defend their profession. The study recognised the academic library in the digital society as a learning centre, and also their major aim is to provide information services in support of teaching, learning and research activities of the university in a digital.

## METHODOLOGY

This study adopted a Survey research design. This design was relevant to this study because it provided a comprehensive and systematic way of collecting vital data on the Impact of ICT applications for service delivery in Federal University Libraries under study. The population of this study comprised of librarians of the selected Federal University Libraries which are: Abubakar Tafawa Balewa University Library, Bauchi State, Ibrahim Badamasi Babangida

**Research Question 1:** What are the types of library service delivery in Federal University Libraries in North East Nigeria?

Library, Modibo Adama University, Yola, and Ramat Library, University of Maiduguri. The target population for this study comprised 105 library staff of the three (3) Federal Universities in North-East Zone Nigeria. The entire population was used for this study; as enumerative. Afolabi (1999), opined that the entire population under study can be adopted if it is manageable in terms of cost and accessibility or subject of the study. Descriptive statistics of frequency counts and percentages were used in analysing the data to answer the research questions, while results were presented in tables and charts where necessary, using the statistical Packages for Social Sciences (SPSS). Meanwhile, the criteria mean of 2.50 was used in deciding on whether to accept the response as positive or reject, as the case maybe. Thus, item with a mean score of 2.50 and above were accepted while items with a mean score of less than 2.50 were rejected.

## DATA ANALYSIS, RESULTS AND DISCUSSION

### RESPONSE RATE

Out of the 105 (100%) of the questionnaires distributed to the respondents in the libraries under study, 88 (83.8%) of the total questionnaires administered were retrieved and found valid for retrieval while only 17 (16.2%) of the questionnaires administered were not retrieved or not valid for the analysis.

**Table 1: The library service delivery**

library Services	SA	A	SD	D	Mean	Decision
Circulation services	2 (2.27%)	5 (5.68%)	64 (72.73%)	17 (19.32%)	1.91	Reject
Reference services	4 (4.55%)	6 (6.82%)	23 (26.14%)	55 (62.50%)	1.53	Reject
Social media services e.g. Whatsapp, telegram, zoom, messengers, etc.	2 (2.27%)	2 (2.27%)	37 (42.05%)	47 (53.41%)	1.53	Reject
serial services	2 (2.27%)	1 (1.14%)	66 (75.0%)	19 (21.59%)	1.84	Reject
Library Consortium service/inter-library loan services	4 (4.55%)	3 (3.41%)	36 (40.91)	45 (51.14%)	1.61	Reject
Internet services	56 (63.64%)	27 (30.7%)	2 (2.27%)	3 (3.41%)	3.55	Accept
information services	1 (1.14%)	0	63 (71.59%)	24 (27.27%)	1.75	Reject
Document delivery Services	0	2 (2.27%)	56 (63.64%)	30 (34.09%)	1.68	Reject
Digital Library services	62 (70.45%)	23 (26.1%)	0	3 (3.41%)	3.64	Accept

Virtual Library services	5 (5.68%)	7 (7.95%)	47 (53.41)	29 (32.95%)	1.86	Reject
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**Key:** S.A- Strongly Agree, A- Agree, TA-Total Agreed S.D- Strongly Disagree, D- Disagree. TD- Total Disagreed

Table 1 shows the analysis of information on the types of library services delivery in the Federal Universities under study. It was revealed that Circulation services (mean = 1.91), Reference services (mean = 1.53), Social media services e.g. Whatsapp, telegram, zoom, messengers, etc.(mean = 1.53), serial services (mean =1.84), Library Consortium service/inter-library loan services (mean=1.61), Internet services (mean = 3.55), information services (mean =1.75), Document delivery Services (mean =1.68), Digital Library services(mean = 3.64), Virtual

Library services (mean = 1.86), The findings revealed that only internet services and digital library services are active, this appears to be different from the work of Iya (2020), who revealed that ICT is available and being utilized in the Serials Division, Circulation Unit, Reference Section, Cataloguing and Classification of academic libraries in Nigeria. The author also confirmed that ICT facilities were used in the E-library and Acquisition department of academic libraries in Nigeria.

**Research Question 2:** What are the types of ICT facilities in Federal University Libraries in the North East Zone, Nigeria?

**Table 2: The types of ICT facilities.**

S/n	Types of ICT facilities for service delivery	IBB	ATBU	RAMAT
1	Computers	√	√	√
2	Printer	√	√	√
3	Scanner	√	√	√
4	Internet	√	√	√
5	Photocopy machine	√	√	√
6	CCTV	√	√	X
7	Projector	√	√	√
8	E-mail	√	√	√
9	CD-ROMS	√	√	√
10	Databases	√	√	√
11	Flash drives	√	√	√
12	OPAC	√	√	√

**Key:** Available .... √      Not Available .... X

Table 2 shows that the three (3) libraries under study have ICT facilities available that include computers, printers, scanners, internet, photocopy machines, projectors, e-mail, CD-ROM, databases, flash drives, and OPAC except for Ramat Library of the university of Maiduguri that lack CCTV. This finding corroborated with work of Ugwuanyi (2019) which revealed that there are ICT facilities in the south-east university libraries studied as indicated by more than 75% of the ICT facilities available were: computers, interconnectivity, LAN, CD-Writer, photocopy

machines, projector, e-mail, databases, flash drives cataloging software power point projector and scanner. In the same vein, Krubu and Osawaru’s (2019) findings identified ICT resources and the use of the resources available at John Harris and Benson Idahosa University libraries as search engines, internet, CD-ROM, Online databases, and the World Wide Web. These resources are used to acquire, store, process, retrieve, and disseminate information. ICT has made it possible for Nigerian academic libraries to use the internet for search engines

such as Yahoo, Google, e-mail, etc, and to access online digital resources such as Amazon, Wikipedia etc

**Research Question 3:** What is the impact of ICT facilities on service delivery in Federal University Libraries in North East, Nigeria?

**Table 3: The impact of ICT facilities on service delivery.**

Impact of ICT Facilities	SA	A	SD	D	Mean	Decision
ICT makes service delivery easier	19 (21.59%)	57 (64.77%)	5 (5.68%)	7 (7.95%)	3.02	Accept
It helps Librarians to attend more clients in a short time	21 (23.86%)	45 (51.14%)	12 (13.64%)	10 (11.36%)	2.85	Accept
It exposes librarians to the usage of ICT facilities	31 (35.23%)	41 (46.59%)	10 (11.36%)	6 (6.82%)	3.06	Accept
It enables librarians to carry out multiple tasks at a time	18 (20.45%)	43 (48.86%)	20 (22.73%)	7 (7.95%)	2.67	Accept
ICT facilities are user-friendly	40 (45.45%)	25 (28.41%)	11 (12.50%)	2 (2.27%)	2.84	Accept
It keeps librarians up-to-date in his/her field	51 (57.95%)	13 (14.77%)	6 (6.82%)	18 (20.45%)	3.24	Accept
ICT aids in the sharing of information resources between libraries	53 (60.23%)	17 (19.32%)	4 (4.55%)	14 (15.91%)	3.35	Accept
ICT facilities have a long-term ill-health effect on librarians	52 (59.09%)	27 (30.68%)	6 (6.82%)	3 (3.41%)	3.42	Accept

**Key:** S.A- Strongly Agree, A- Agree, TA-Total Agreed S.D- Strongly Disagree, D- Disagree. TD- Total Disagreed

Table 3 shows the analysis of information on the impact of ICT facilities on service delivery in the Federal Universities under study. It was revealed that ICT makes service delivery easier (mean = 3.02), It helps Librarians to attend more clients in a short time (mean =2.85), It exposes librarians to the usage of ICT facilities (mean =3.06), It enables librarians to carry out multiple tasks at a time (mean=2.67), ICT facilities are user-friendly (mean= 2.84), It keeps librarians up-to-date in his/her field ( mean =3.24), ICT aids in the sharing of information resources between libraries (mean =3.35), ICT facilities have a long-term ill-health effect on librarians (mean = 3.42 ), This has relate with the work of Anup (2019) which opines that the application of ICT

in university libraries for service delivery reduces the tedious and energy-sapping tasks associated with manual operations in the library. It enables university library staff to reduce repetition, sharing of information resources among libraries, drudgery, and time-consuming activities such as typing, record-keeping, and accounting. Madu (2004) revealed that the application of ICT in library operation is that the library staff will have more energy and time, which can be used to attend to more library users and perform more professional duties.

**Research Question 4:** What is the extent of utilisation of ICT facilities for service delivery in Federal University Libraries, North-East, Nigeria?

**Table 4: The extent of utilization of ICT facilities in your library.**

Variable	VHE	HE	VLE	LE	Mean	Decision
Laptop/computers	53 (60.23%)	21 (23.86%)	5 (5.68%)	9 (10.23%)	3.07	Accept
Printer	34 (38.64%)	37 (42.05%)	11 (12.50%)	6 (6.82%)	1.74	Reject
Scanner	2 (2.27%)	9 (10.23%)	36 (40.91%)	41 (46.59%)	3.34	Accept
Internet	54 (61.36%)	19 (21.59%)	9 (10.23%)	6 (6.82%)	2.07	Reject
Photocopy machine	9 (10.23%)	21 (23.86%)	33 (37.50%)	25 (28.41%)	1.81	Reject
Webcam	12 (13.64%)	10 (11.36%)	51 (58.02%)	15 (17.05%)	2.23	Reject
Projector	8 (9.09%)	19 (21.59%)	15 (17.05%)	46 (52.27%)	3.67	Accept
E-mail	65 (73.03%)	21 (23.60%)	2 (2.25%)	1 (1.12%)	1.86	Reject
CD-ROMS	6 (6.82%)	5 (5.68%)	29 (32.95%)	48 (54.55%)	2.88	Accept
Databases	16 (18.18%)	53 (60.23%)	8 (9.09%)	11 (12.50%)	3.26	Accept
Flash drives	30 (34.09%)	51 (57.95%)	0	7 (7.95%)	2.78	Accept
OPAC	21 (23.86%)	37 (42.05%)	10 (11.36%)	20 (22.73%)	3.07	Accept

**Key:** VHE- Very High Extent, HE- High Extent, THE-Total High Extent, VLE- Very Low Extent, LE- Low Extent, TLE-Total Low Extent

Table 4 shows the analysis of information on extent of utilization of ICT facilities for service delivery in the Federal Universities under study. It was revealed that Laptop/computers (mean =3.07), Printer (mean =1.74), Scanner (mean =3.34), Internet (mean =2.07), Photocopy machine(mean = 1.81), Webcam (mean =2.23), Projector (mean = 3.67), E-mail (mean =1.86), CD-ROMS (mean =2.88), Databases (mean =3.26), Flash drives(mean =2.78), OPAC (mean= 3.07), The findings revealed laptops/computers, printers, internet, e-mail, databases, flash drives, and OPAC are used to a high extent. While CD-ROM, scanners, webcams, photocopiers, and projectors are utilized to a low extent. This study

corroborate with the work of Khan (2016) who posited that ICT deals with the use of electronic computers, internet, e-mail, databases and software to convert, store, process, transmit and retrieve information. It is a generic term that covers the acquisition, processing, storage, and dissemination of information. It involves the application of computers and communication technology in the task of information handling and information flow from generation to utilization levels. Therefore, ICT is those tools and technologies that facilitate the easy creation and use of information, knowledge, and ideas in all spheres of human endeavor.

**Research Question 5:** What are the challenges facing the application of ICT to service delivery in Federal University Libraries in North East, Nigeria?

**Table 5: The challenges facing the application of ICT in service delivery.**

Variable	SA	A	SD	D	Mean	Decision
Lack of motivation	29 (32.95%)	52 (59.09%)	2 (2.27%)	5 (5.68%)	3.23	Accept
Reluctance in accepting changes	42 (47.73%)	37 (42.05%)	5 (5.68%)	4 (4.55%)	3.32	Accept
Inadequate funding	33 (37.50%)	32 (36.36%)	10 (11.36%)	13 (14.77%)	3.00	Accept
Inadequate internet connectivity	41 (46.59%)	45 (51.14%)	0	2 (2.27%)	3.44	Accept
Erratic power supply	43 (48.86%)	35 (39.77%)	2 (2.27%)	8 (9.09%)	3.35	Accept
Inadequate ICT facilities	19 (21.59%)	46 (52.27%)	11 (12.50%)	12 (13.64%)	2.83	Accept
High cost of facilities and bandwidth	21 (24.14%)	39 (44.83%)	16 (17.24%)	12 (13.79%)	2.74	Accept
Inadequate manpower	26 (29.55%)	42 (47.73%)	15 (17.05%)	5 (5.68%)	2.90	Accept
Lack of maintenance culture	19 (21.59%)	36 (40.91%)	9 (10.23%)	24 (27.27%)	2.74	Accept
Inadequate training	15 (17.05%)	46 (52.27%)	14 (15.91%)	13 (14.77%)	2.70	Accept
Low capacity infrastructure	12 (13.64%)	25 (28.41)	20 (22.73%)	31 (35.23%)	2.33	Accept

**Key:** S.A- Strongly Agree, A- Agree, TA-Total Agreed S.D- Strongly Disagree, D- Disagree. TD- Total Disagreed

Table 5 shows the analysis of information on the challenges facing the application of ICT to service delivery in the Federal Universities under study. It was revealed that Lack of motivation(mean =3.23), Reluctance in accepting changes (mean =3.32), Inadequate funding(mean=3.00), Inadequate internet connectivity (mean =3.44), Erratic power supply (mean =3.35), Inadequate ICT facilities (mean =2.83), High cost of facilities and bandwidth (mean =2.74), Inadequate manpower

(mean=2.90), Lack of maintenance culture (mean=2.74), Inadequate training(mean=2.70), Low capacity infrastructure (mean= 2.33), The result of the findings shows that there's inadequate internet connectivity, lack of motivation, reluctance to accept changes, erratic power supply, inadequate manpower, inadequate funding, inadequate ICT facilities, inadequate training, high cost of facilities and bandwidth, lack of maintenance culture and low capacity infrastructure except for low perception of the

worth and value of libraries to national development are the challenges facing the application of ICT in services delivery in the Federal Universities under studies. The most challenging of these is funding followed by erratic power supply, internet connectivity, and inadequate facilities in the library. This finding corroborates with the work of Krubu and Osawaru (2021) which reveals some factors hindering the impact of ICT in Nigerian university libraries as lack of search skills, epileptic power supply, expensive software and hardware, and huge amount of money spent to fuel generators. In a similar vein Ikupolati, (2019) revealed the challenge associated in university libraries with the ICT technical infrastructure in most libraries is the lack of adequate ICT facilities. Lack of funding means that most libraries are not able to acquire adequate ICT facilities to enable them to provide efficient and effective ICT-based information resources and library services to their users. Most libraries cannot get adequate bandwidth to enable them to provide fast access to online- based information services. In some libraries, the internet connection is so slow that sometimes it is impossible to download and print documents from the internet.

### Conclusion

Based on the findings of this study, it is concluded that most of the services in the federal university libraries in North East Nigeria are not yet fully electronic, except for internet services and digital library services. The study further concludes that the major ICT facilities available in these libraries include computers, printers, scanners, internet connectivity, photocopy machines, projectors, e-mail, CD-ROMs, databases, flash drives, and OPAC. It was concluded that some of the impacts of ICT Applications are that ICT makes service delivery easier, exposes librarians to the usage of ICT facilities, helps Librarian to attend to more clients in a short time, it enables librarians to carry out multiple tasks at a time, are user friendly, it keeps librarian up-to-date in his/her field and it aid in sharing of information resources between libraries in the Federal University Libraries in North-East Zone, Nigeria. The extent of utilization revealed laptops/computers, printers,

internet, e-mail, databases, flash drives, and OPAC are used to a high extent. While CD-ROM, scanner, webcam, photocopiers, and projectors are utilized to a low extent, The findings reveal that lack of motivation, reluctance to accept changes, inadequate funding, inadequate internet connectivity, erratic power supply, inadequate ICT facilities, high cost of facilities and bandwidth, inadequate manpower, lack of maintenance culture, inadequate training and low capacity infrastructure except for low perception of the worth and value of libraries to national development are the challenges facing the application of ICT in services delivery in the Federal Universities under study.

### Recommendations

Based on the findings of this study, the following recommendations are made. That the:

1. Management of federal university libraries in the North-East Zone, Nigeria should expand and improve electronic and ICT-based services to enhance efficiency and service delivery.
2. Libraries should acquire and regularly upgrade current ICT facilities such as computers, scanners, projectors, and reliable internet access for effective library operations.
3. Adequate software and hardware applications should be provided to enable librarians to deliver quality information services.
4. Regular training and workshops should be organized to build librarians' ICT skills and address challenges such as inadequate funding, poor internet connectivity, erratic power supply, and insufficient manpower.

## REFERENCES

- Abubakar M.B & Garba K. G (2020) Evaluative study of information resources and services utilization for research in academic libraries in Niger state, Nigeria. *International Journal of Research in Business Management*.
- Aliyu; H and Muhammed J (2021), Application of ICT for Resources Organization and Service Delivery in Academic Libraries in Bauchi State, Nigeria" (2021). *Library Philosophy and Practice* (e-journal). 6738. <https://digitalcommons.unl.edu/libphilprac/6738>
- Anup S (2019), ICT and its Impact on Library and Information Services: A Case Study of Kendriya Vidyalaya Libraries. *International Journal of Science and Research (IJSR)* ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438 at the University of Agriculture Library Abeokuta, Nigeria *Library Review*, Vol. 52 (5):
- Baro, E.E and Asaba, J.O (2010). Internet connectivity in university libraries in Nigeria: the based development: a partial review of the evidence. *World Bank working paper*, no. 12
- David, T. L. (2001). *ICT for Library and Information Professionals: A Training Package for Developing Countries (ICTLIP)*. Retrieved June 26, 2009, from eLibrary Download Page: <http://www2.unescobkk.org/elib/publications/ictlip/index.htm>.
- IFLA publications (2001). The public library services: IFLA/UNESCO guidelines or development Philip Gill (Ed). *International Federation of Library Associations* (IFLA).
- Ikupolati, W.O. (2019). Current trends in ICT availability in southeastern Nigeria. *The information technologist*. 4(2) 45-60
- Jensen, M. (2005). *The African experience: Building both supply and demand: A presentation at the InfoDev workshop, March 14, 2005, at the World Bank Office, Paris*. Available: <http://www.infodev.org/en/Publication.52.html>
- Johnson, C. (2019). The delivery and support of information services for academic research. *Journal of Documentation*, 29(19), 85-102.
- Khan, J. (2016) Impact of Information Communication Technology on Library and Its Services. *International Journal of Research Granthaalayah*, 4, 97-100.
- Krubu, D.E. and Osawaru, K. (2021). The Impact of Information and Communication Technology (ICT) in Nigerian University Libraries. [http://www.scirp.org/\(S\(1z5mqp453edsnp55rrgjt55\)\)/](http://www.scirp.org/(S(1z5mqp453edsnp55rrgjt55))/)
- Lewis D. L (2007). A Strategy for Academic Libraries in the First Quarter of the 21st Century. *College and Research Libraries* 68 (5) 418 – 434.
- Muhammad and Elvis R (2021). Academic Library and Challenges of Service Delivery in Nigerian Universities in the Digital Era. *Information Impact: Journal of Information and Knowledge Management*, 12:2,51-61,DOI<https://dx.doi.org/10.4314/ijikm.v12i2.4>
- Ngenge (2016), “Effects of information and communication technology on students' learning: A case of Gulu University”, Dissertation. Nigeria: Makerere University.



Tiemo A. P. and Edewor, N (2011). ICT Readiness of Higher Institutions' Libraries in Nigeria. Trends and challenges. *International Journal of Library & Information Science (IJLIS)*:6(6), pp. 68–74

UNESCO (2010). The UNESCO ICT in education program. United Nations Educational, Scientific and Cultural Organization (UNESCO): Bangkok, Thailand.

[www.unescobkk.org/education/ict](http://www.unescobkk.org/education/ict)

Zulu, S.F.C (2011). Communication technology policy framework for Africa. In: Adomi E.E (ed) *Frameworks for ICT policy: government, social and legal issues*. Hershey P.A: IGI Global.